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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/694,098	10/27/2003	Gerald A. Raitzer	2003P14310US	3106

7590 01/22/2007  
Siemens Corporation  
Intellectual Property Department  
170 Wood Avenue South  
Iselin, NJ 08830

EXAMINER
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JAWORSKI, FRANCIS J

ART UNIT	PAPER NUMBER
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3768

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/22/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/694,098

Applicant(s)

RAITZER ET AL.

Examiner

Jaworski Francis J.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 15 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1, 3-10, 12, 13 and 20-24 is/are allowed.
- 6) ☒ Claim(s) 11, 14 and 17-18 is/are rejected.
- 7) ☒ Claim(s) 15, 16 and 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |                                                                                                            |                                                                                         |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11 as amended and new claim 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blaker et al (US4581636) or Teslawski et al (US4517985) in either case further in view of Herres (US.5070879) or Haverl (US.4137777).

Blaker et al is directed to correction of uneven scanning during scan conversion by using an LUT to derive corrected conversion positions for scan data obtained in the presence of transducer wobble error. Accordingly this represents a memory-based correction of scan position on the receiver storage side.

Teslawski et al uses a ROM to load a firing code for a mechanically wobbling sector scanner to provide offset corrections to the transmit firing per cols. 10 – 11 bridging.

Herres is directed in col. 4 to position-feedback based servocontrol of a mechanically rocked ultrasound volume scanner where the volume is obtained inter alia by successive single plane scans shifted in the cross-direction to the rocking of the scanner.

Haverl et al on the other hand embraces an annular array as a single-transducer substitute therein for purposes of 3D scanning, see Fig. 4b.

These characterizations serve as a basis for four rejections:

Since Blaker et al is limited to scan position correction in two dimensions using LUT memories on the **receiver side** in association with scan conversion spatial positioning of data, on the one hand Herres evidences that a volume scan in one alternative may simply be a stack of two-d mechanically rocked scan planes hence the scanplane-limited setting of spatial relationships for already-received data of Blaker et al could obviously be implemented in association with any one of Herres' successive scanplane mechanical sweeps, thereby meeting the 'array/volume limitations since the position determination is not necessarily across scanplanes as recited. On the other hand Haverl et al evidences that artisans also used annular arrays for two-d sweeps in order to focus, and just as claim 11 does not recite scan position setting across the volume it does not also indicate that the 'array' for purposes of associated velocity determination is associated with three-dimensional activity, hence an array used to determine velocity parameters in planar fashion for purposes of effecting the correction of Blaker et al suffice.

Since the 'scan position language' also pertains to corrective re-directing of scanline firings within frames on the **transmit side**, then Teslawski et al pertains to using a memory ROM to store mechanical scanner non-linearities and applying corrective spatial positioning. Again, both secondary teachings apply in association with this alternative interpretation, namely that Herres evidences that a mechanically rocked scan volume may be composited from a succession of conventional 2D scanplane

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acquisitions, and Haverl et al evidences that a 2D plane scanning array may scan within an investigated volume region of the body (such as within the chest cavity) and consist of an annular array, whereupon the claims' constraints are again met since neither the array actions nor the scan position setting are necessarily practiced across a volume region during the recited steps.

Claims 14 and 17 – 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 11 above, and further in view of Dunham of record, insofar as Dunham (US6080108, of record) being directed to use of an angle potentiometer to sense even scanplane increments and trigger the transmit beamformer for acquisition of full scanplane data for volume scanning at even increments of rocked 3D scan positions would evidence that beamforming on either the transmit or receive side would be associated with the aforementioned scan position determinations as functions of velocity related parameters variously characterizing the mechanical scan sweep unevenness.

### ***Allowable Subject Matter***

Claims 1 and 3 – 10, 12 – 13, and 20 – 24 are allowed.

Claims 15 – 16 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Elichai et al (US6831736) is directed to a combined mechanical and optical scanner for unidirectional (not rocked) scanning of a surface (not volume) where static and dynamic 'jitter' errors positional errors associated respectively with uneven relative motion increment during relative Y-motion (scan direction) and instability of start time and intervals of scan during X-motion (cross-scanning) as defined in col. 2 are compensated for by LUT correction profiles.

Mochizuki (US5152294 of record) generically suggests closed loop (col. 4,col. 5, col.7) control of scan plane acquisition during mechanically rocked ultrasound volume scanning.

Paulsen (US<sup>797749</sup>~~4581636~~) cols. 10 – 11 bridging pertains to use of an LUT memory in order to compensate for scanning error using a velocity related parameter as an input.

O'Toole (US4896672) is directed to using a scaled position signal to correct for interframe jitter when using a mechanically rocked ultrasound transducer.

Shiraishi et al (US4805155) is directed to elimination of ultrasound scan plane blurring error for a mechanically rocked sector scan by phase comparison-based motor speed control of the scan motor.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

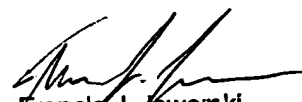
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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication should be directed to Jaworski Francis J. at telephone number 571-272-4738.

FJJ:fjj

01102007



Francis J. Jaworski  
Primary Examiner